

# Instream Flows in Texas

Kathy Alexander

Texas Commission on Environmental Quality



# Outline

- Legal Basis for Instream Flow Protection
- Current Process
- Senate Bill 2
- New Initiatives

# Statutory Authority

- TWC §§ 11.147, 11.1491, 11.150, and 11.152 require the Texas Commission on Environmental Quality (TCEQ) to assess the effects of a water use permit application on existing instream uses, water quality, fish and wildlife habitat, and freshwater inflow needs for bays and estuaries.

# TCEQ Rules

Texas Administrative Code

Title 30- Environmental Quality

Chapter 297 – Water Rights

- §297.53 - Habitat Mitigation
- §297.54 - Water Quality Effects
- §297.55 - Estuarine Considerations
- §297.56 - Instream Uses

# Applications Subject to an Environmental Assessment

- New permits
- Amendments requesting:
  - Increase in total appropriative amount
  - Relocation of diversion point
  - Change in diversion rate
  - Change in place of use (e.g., interbasin transfers)

# Current Process

- Environmental reviews of water right applications are conducted on a case-by-case basis
- Staff perform field visits at some sites but many reviews are conducted using desktop methods

# Current Process (cont.)

- In the absence of site-specific biological data, Texas uses the Lyons' Method (Bounds and Lyons, 1979) and/or 7Q2 value (when > Lyons').
- **EXAMPLE:** In order to provide sufficient flows for the instream uses of the Texas River, diversions of water should be limited to times when streamflow equals or exceeds the following flows at USGS gaging station #08000000:"

## *Recommended flows (cfs)*

Jan	Feb	Mar	Apr	May	Jun	Etc.
11	14	37	40	64	40	Etc.

# Water Availability Determinations

- Water Availability is determined using a monthly time step model
  - WRAP developed by Dr. Ralph Wurbs at Texas A&M University
- The amount of water available for appropriation is limited by the amount of the instream flow requirement
- Lyons' Method requirements are easily incorporated into the Water Availability Models by converting the requirement in cfs to a monthly volume in acre-feet for input into the WAM (Water Availability Model)



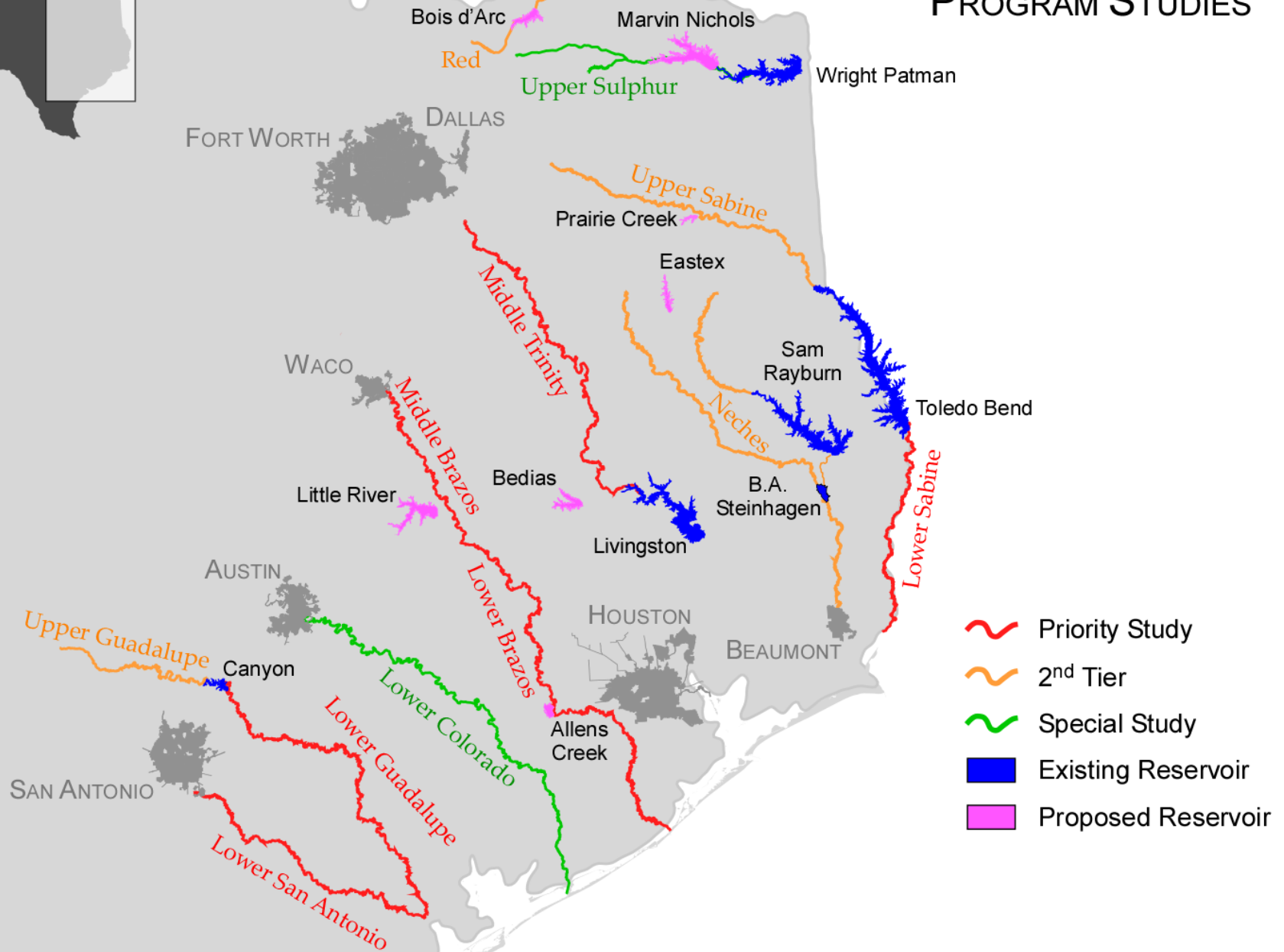
# **Instream Flow Science in Texas is changing!**

- Texas is a very large state with highly diverse aquatic ecosystems
- We have limited data and understanding of linkages between flow and biological diversity in most rivers or river segments
- We have no ability to generalize from the limited data we do have because we have no overarching framework for understanding Texas rivers

# Senate Bill 2

- Recognition of the importance of maintaining a healthy ecosystem while meeting human needs for water
- Acknowledgment that decisions about water management should consider the *best science available*
- The Texas Legislature directed TPWD, TWDB and TCEQ to:
  - Establish data collection and evaluation programs
  - Determine flow conditions necessary to support a sound ecological environment in Texas rivers and streams
  - Complete priority studies by December 31, 2010

# TEXAS INSTREAM FLOW PROGRAM STUDIES



# Status

- Programmatic Work Plan and Technical Overview Document (draft) developed
- Review of program by National Academy of Sciences (National Research Council); Report published March 2005
- Revision of Technical Overview Document
- Study planning in Brazos, Sabine and San Antonio river basins

**Study Design**



**Evaluations**

**Hydrology  
Hydraulics**

**Physical  
Processes**

**Water  
Quality**

**Biology**



**Integration**



**Interpretation**



**Study Report**



**Monitoring  
Validation**

# Instream Flow Study Elements



# TCEQ Initiatives

- Priority studies will take time and are only performed for the main stems of rivers
  - HIP/HAT for Texas
  - Stream Classification System (SCT)
  - BAIT
- By April '06, HIP/HAT and the SCT projects had FY07 funding

# HIP/HAT for Texas

- Hydroecological Integrity Assessment Process (HIP)
- Calculate 171 indices using Hydrologic Index Tool (HIT) on representative Texas gage records
- Classify streams & identify 10 primary flow indices descriptive of a small set of stream types
  - representing five main components of flow: magnitude, frequency, duration, timing & rate of change

# Stream Classification Project Objectives

- Identify available data sources relevant to the determination of instream flow criteria (e.g., geologic, soils, climate, water chemistry, NHD+)
- Supply these data at the scale of TCEQ classified segments
- Provide a common platform for serving these data
- Integrate these data to the extent practicable to provide a classification scheme



# BAIT

- Objectives: catalog available aquatic biological data, develop a standard for data delivery, optimize spatial referencing inherent in aquatic data
- Examples of data sources and projects:
  - Digital Fish Atlas of Texas under development at UT
  - Develop a catalog of fish and benthic macroinvertebrate data available for Texas
  - Bring TPWD scientific permits program online

# Implications for availability determinations

- Transforming a new generation of permit requirements into monthly values in acre-feet
  - Pulse flows
  - Varying streamflow requirement that depends on whether the season is classified as wet, average, dry
- New capabilities required for Texas Water Availability Models
  - Project completed May 2007

# Questions?

## Contact Information:

Kathy Alexander

512-239-0778

[kalexand@tceq.state.tx.us](mailto:kalexand@tceq.state.tx.us)

Lann Bookout

512-239-4609

[lbookout@tceq.state.tx.us](mailto:lbookout@tceq.state.tx.us)